

# Weekly Report

June 3<sup>rd</sup>, 2018

## Done:

1. Finish the *Recurrent Neural Networks* part on Coursera, start the *Natural Language Processing & Word Embeddings* part.
2. Read lots of paper on provenance analysis using visualization. Discuss with Prof. Ma and Takanori, decided that my focus should be on data/visualization provenance (combined with storytelling). The system observes users' operations/interactions, help them find the most critical attributes based on our summary of their interactions. The summary should remove useless interactions/useless data transformations, identify important ones, and make annotations. The system should also help users recover these analysis interaction provenances.

## To Do:

1. Finish the final lectures and assignments of DL course.
2. Refine the topic. I will make ppt slides first and have discussions.

## Paper reading:

1. EuroVis16 *From Visual Exploration to Storytelling and Back Again* 这是一款对于可视分析过程进行分析的产品, 记录了用户操作, 用户可以随时回退到某一个节点; 也可以随时从某一个节点重新出发, 进行另一条路的探索. 也可以展示整个过程(storytelling). 这些交互操作等记录为 provenance graph, 用 DoI(degree of interest)来呈现重要与非重要的节点.

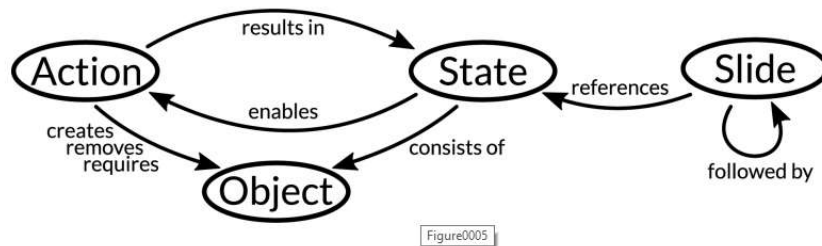


Figure 5.

The provenance graph data model consists of four different node types that are connected with each other by one or more edges.

2. EuroVis16 *AVOCADO: Visualization of Workflow-Derived Data Provenance for*

*Reproducible Biomedical Research* 本文和上文是同一家东西, 也是一个产品, 但是本文侧重的在于我一旦有这个图, 这个图非常大, 我该怎么去展示? 怎么方便用户交互? 提供一系列压缩/聚合和还原的操作.

3. EuroVis13: *ExPlates: Spatializing Interactive Analysis to Scaffold Visual Exploration* 不同于前面, 本文是数据出发, 通过一系列操作生成可视化图表(比较简单的那些, 在图表上可以做进一步的交互分析)、分析. 对我下一个 idea 来说, 有那么一点像是这篇和 1 的结合体.

4. CHI18 *A Visual Interaction Framework for Dimensionality Reduction Based Data Exploration* Dynamically reasoning DR, 提出两种交互技术, forward projection 和 backward projection. 前者是交互改变数据 input 的 attributes, 来观察对输出的影响; 后者是反过来, 改变结果, 再观察 input 需要做哪些改动. 用 PCA 和 autoencoder 两个东西做例子. 这篇文章切入点很小, 但是很有用. 最后提出本文其实可以适用于其他黑盒模型, 尤其是 DNN 这种. 他做了具体解释, 其实很多现有方法已经用到了这里的思想.

5. TVCG2016 *Characterizing Provenance in Visualization and Data Analysis: An Organizational Framework of Provenance Types and Purposes*

综述, 下图得之:

Types of Provenance Information	
<b>Data</b>	The history of changes and movement of data, which can include subsetting, data merging, formatting, transformations, or execution of a simulation to ingest or generate new data
<b>Visualization</b>	The history of graphical views and visualization states
<b>Interaction</b>	The history of user actions and commands with a system
<b>Insight</b>	The history of cognitive outcomes and information derived from the analysis process, including analytic findings and hypotheses
<b>Rationale</b>	The history of reasoning and intentions behind decisions, hypotheses, and interactions
Purposes for Provenance	
<b>Recall</b>	Maintaining or recovering memory and awareness of the current and previous states of the analysis
<b>Replication</b>	Reproducing the steps or workflow of a previous analysis
<b>Action recovery</b>	Maintaining the action history that allows undo/redo operations and branching actions during analysis
<b>Collaborative communication</b>	Communicating and sharing data, information, and ideas with others who are conducting the same analysis
<b>Presentation</b>	Communicating the insights or progression of the analysis with those who are not directly involved with the analysis themselves, such as general public, upper levels of management, or analysts focusing on other areas
<b>Meta-analysis</b>	Reviewing the analytic processes themselves in order to understand and improve aspects of the analysis (such as process efficiency, training efficiency, or analytic strategies)